PTO/SB/21 (09-04)

OIPE MAR 17 2005 PATENT & TRADEMARK OFFICE

TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission	37

Application Number	09/851,940
Filing Date	May 10, 2001
First Named Inventor	Baraff, David E.
Art Unit	2671
Examiner Name	Scott A. Wallace
Attorney Docket Number	021751-002200US

ENCLOSURES *(Check all that apply)*

- ☐ Fee Transmittal Form
  - ☐ Fee Attached
- ☐ Amendment/Reply
  - ☐ After Final
  - ☐ Affidavits/declaration(s)
- ☐ Extension of Time Request
- ☐ Express Abandonment Request
- ☐ Information Disclosure Statement
- ☐ Certified Copy of Priority Document(s)
- ☐ Reply to Missing Parts/ Incomplete Application
  - ☐ Reply to Missing Parts under 37 CFR 1.52 or 1.53
- ☐ Drawing(s)
- ☐ Licensing-related Papers
- ☐ Petition
- ☐ Petition to Convert to a Provisional Application
- ☐ Power of Attorney, Revocation Change of Correspondence Address
- ☐ Terminal Disclaimer
- ☐ Request for Refund
- ☐ CD, Number of CD(s) _____
  - ☐ Landscape Table on CD
- ☐ After Allowance Communication to TC
- ☐ Appeal Communication to Board of Appeals and Interferences
- ☐ Appeal Communication to TC **(Appeal Notice, Brief, Reply Brief)**
- ☐ Proprietary Information
- ☐ Status Letter
- ☒ Other Enclosure(s) (please identify below):

Return Postcard;
Application for Patent Term Adjustment Correction (3 pages);
Exhibit A (30 pages); and
Exhibit B (2 pages)

Remarks The Commissioner is authorized to charge any additional fees to Deposit Account 20-1430.

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	Townsend and Townsend and Crew LLP		
Signature	S. B. Kotwal		
Printed name	Sujit B. Kotwal		
Date	03-14-2005	Reg. No.	43,336

CERTIFICATE OF TRANSMISSION/MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below.

Signature			
Typed or printed name	TIFFANY WU	Date	3/14/05

60443119 v1

PATENT
Docket No.: 021751-002200US

On 3/14/05

TOWNSEND and TOWNSEND and CREW LLP

By: _____
Tiffany Wu

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:	Examiner: Wallace, Scott A.
DAVID E. BARAFF et al.	Art Unit: 2671
Application No.: 09/851,940	APPLICATION FOR PATENT TERM ADJUSTMENT CORRECTION
Filed: May 10, 2001	
For: GLOBAL INTERSECTION ANALYSIS FOR DETERMINING INTERSECTIONS OF OBJECTS IN COMPUTER ANIMATION	

Box Petitions
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Applicant requests reconsideration of the patent term adjustment indicated in the Notice of Allowance dated December 16, 2004 received from the U.S. Patent and Trademark Office (USPTO).

The Notice of Allowance indicates a patent term adjustment of 214 days. Applicant submits that this is incorrect. Applicant believes the patent term adjustment should be 315 days. Presented below is Applicant's calculation basis for requesting a patent term adjustment of 315 days (calculated up to December 16, 2004--the date of mailing of the Notice of Allowance).

The PAIR information for this application indicates that the USPTO has subtracted 61 days and 101 days from the patent term adjustment period pursuant to 37 CFR 1.704. Applicant submits that the subtraction of the 101 days is in error. The USPTO has calculated the 101 days for an alleged delay in responding to a non-final Office Action (1st Office Action) dated July 21, 2003. The USPTO calculation alleges that the response to the non-final Office Action was filed on January 20, 2004 resulting in a 101 days delay.

Applicant however submits that a proper and timely response to the Office Action dated July 21, 2003 was filed via facsimile by the Applicant on October 21, 2003, i.e., within 3-months of the date of the Office Action. A copy of the response as filed is enclosed herewith as **Exhibit A**. The documents in **Exhibit A** comprise a Fax Cover Sheet which indicates that the documents were faxed on October 21, 2003. **Exhibit A** also comprises a Transmittal Form with a certification indicating that the documents were filed via facsimile on October 21, 2003. Also attached herewith is an Auto-Reply Facsimile Transmission sheet (see **Exhibit B**) received from the USPTO indicating that the faxed documents were received by the USPTO on October 21, 2003.

In light of the above, Applicant submits that a proper and timely response to the Office Action dated July 21, 2003 was filed on October 21, 2003. Accordingly, the delay caused by Applicant in responding to this Office Action under 37 CFR 1.704 is 0 days--not 101 days as calculated by the USPTO. Accordingly, the total days calculated under 37 CFR 1.704 should be only 61 days--and not 162 days.

The documents that were previously filed on October 21, 2003 were re-faxed to the USPTO on January 30, 2004 per the Examiner's request. This date is however irrelevant to the calculation under 37 CFR 1.704.

Based upon the above, Applicant submits that as of December 16, 2004, the total patent term adjustment for this application should be 315 days (376-0-61), which is the difference between the sum of periods calculated under 37 CFR §1.703 (376 days) and the sum of periods calculated under 37 CFR §1.704 (61 days).

The instant application is not subject to any terminal disclaimer.

Please deduct the processing fee of $200.00, pursuant to 37 CFR §1.18(e), from Deposit Account No. 20-1430 of the undersigned, and charge any additional fees or credit overpayment to the above Deposit Account.

Respectfully submitted,

S. B. Kotwal

Sujit B. Kotwal
Reg. No. 43,336

TOWNSEND and TOWNSEND and CREW LLP
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Tel: (415) 576-0200
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SBK:ewm

60435567 v1

Exhibit A

ATTACHMENT A

Atty Docket No. 21751-002200US

PTO FAX NO.: (703) 872-9314
ATTENTION: Examiner Linzy T. McCartney
TELEPHONE NO.: (703) 605-0745

Group Art Unit 2671

OFFICIAL COMMUNICATION AMENDMENT, REVOCATION OF POWER OF ATTORNEY, POWER OF ATTORNEY, STATEMENT UNDER 3.73(B) FOR FOR ENTRY IN U.S. PATENT APPLICATION NO. 09/851,940, FILED MAY 10, 2001

FOR THE PERSONAL ATTENTION OF EXAMINER LINZY T. MCCARTNEY

CERTIFICATION OF FACSIMILE TRANSMISSION

I hereby certify that the following document(s) in re Application of DAVID E. BARAFF et al., U.S. Application No. 09/851,940, filed May 10, 2001 for GLOBAL INTERSECTION ANALYSIS FOR DETERMINING INTERSECTIONS OF OBJECTS IN COMPUTER ANIMATION are being facsimile transmitted to the U.S. Patent and Trademark Office on the date shown below.

Document(s) Attached

1. SB/21 Transmittal Form (1 page)
2. SB/17 Fee (in duplicate) (2 pages)
3. Amendment (21 pages)
4. Revocation of Power of Attorney or Authorization of Agent (1 page)
5. Power of Attorney or Authorization of Agent (1 page)
6. Statement Under 3.73(b) w/ copy of Assignment as filed (2 pages)

Number of pages being transmitted, including this page: 29

Dated: October 21, 2003

Krista K. Merrimac

PLEASE CONFIRM RECEIPT OF THIS PAPER BY RETURN FACSIMILE AT (650) 326-2422

TOWNSEND and TOWNSEND and CREW LLP
Two Embarcadero Center, 8th Floor
San Francisco, CA 94111-3834
Telephone: 650-326-2400 / Fax: 650-326-2422

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TRANSMITTAL FORM (to be used for all correspondence after initial filing)			
		Application Number	09/851,940
		Filing Date	May 10, 2001
		First Named Inventor	Baraff, David E.
		Art Unit	2671
		Examiner Name	Linzy T. McCartney
Total Number of Pages in This Submission	1	Attorney Docket Number	21751-002200US

ENCLOSURES *(Check all that apply)*

☒ Fee Transmittal Form	☐ Drawing(s)	☐ After Allowance Communication to Group
☐ Fee Attached	☐ Licensing-related Papers	☐ Appeal Communication to Board of Appeals and Interferences
☒ Amendment/Reply	☐ Petition	☐ Appeal Communication to Group (Appeal Notice, Brief, Reply Brief)
☐ After Final	☐ Petition to Convert to a Provisional Application	☐ Proprietary Information
☐ Affidavits/declaration(s)	☒ Power of Attorney, Revocation Change of Correspondence Address	☐ Status Letter
☐ Extension of Time Request	☐ Terminal Disclaimer	☒ Other Enclosure(s) *(please identify below)*: Power of Attorney, Statement Under 3.73(b) w/ copy of Assignment as originally filed; Certification of Facsimile Transmittal
☐ Express Abandonment Request	☐ Request for Refund	
☐ Information Disclosure Statement	☐ CD, Number of CD(s)	
☐ Certified Copy of Priority Document(s)	Remarks	The Commissioner is authorized to charge any additional fees to Deposit Account 20-1430.
☐ Response to Missing Parts/ Incomplete Application		
☐ Response to Missing Parts under 37 CFR 1.52 or 1.53		

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm or Individual	Townsend and Townsend and Crew LLP Sujit B. Kotwal Reg. No. 43,336
Signature	S. B. Kotwal
Date	October 21, 2003

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being facsimile transmitted to the Patent and Trademark Office, Fax No. (703) 872-9314 on October 21, 2003.

Typed or printed name	Krista K. Merrimac		
Signature	Krista K. Merrimac	Date	October 21, 2003

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FEE TRANSMITTAL for FY 2004

Effective 10/01/2003. Patent fees are subject to annual revision.

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT ($) 194

Complete if Known	
Application Number	09/851,940
Filing Date	May 10, 2001
First Named Inventor	Baraff, David E.
Examiner Name	Linzy T. McCartney
Art Unit	2671
Attorney Docket No.	21751-002200US

METHOD OF PAYMENT *(check all that apply)*

☐ Check ☐ Credit Card ☐ Money Order ☐ Other ☐ None

☒ Deposit Account:

Deposit Account Number: 20-1430

Deposit Account Name: Townsend and Townsend and Crew LLP

The Director is authorized to: *(check all that apply)*

☒ Charge fee(s) indicated below ☒ Credit any overpayments

☒ Charge any additional fee(s) or any underpayment of fee(s)

☐ Charge fee(s) indicated below, **except for the filing fee** to the above-identified deposit account.

FEE CALCULATION

1. BASIC FILING FEE

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
1001	770	2001	385	Utility filing fee	
1002	340	2002	170	Design filing fee	
1003	530	2003	265	Plant filing fee	
1004	770	2004	385	Reissue filing fee	
1005	160	2005	80	Provisional filing fee	

SUBTOTAL (1) ($)

2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE

			Extra Claims		Fee from below		Fee Paid
Total Claims	30	-24** =	6	X	$18	=	$108
Independent Claims	7	-6** =	1	X	$86	=	$86
Multiple Dependent				X		=	

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description
1202	18	2202	9	Claims in excess of 20
1201	86	2201	43	Independent claims in excess of 3
1203	290	2203	145	Multiple dependent claim, if not paid
1204	86	2204	43	** Reissue independent claims over original patent
1205	18	2205	9	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) ($) 194

**or number previously paid, if greater; For Reissues, see above*

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
1051	130	2051	65	Surcharge - late filing fee or oath	
1052	50	2052	25	Surcharge - late provisional filing fee or cover sheet.	
1053	130	1053	130	Non-English specification	
1812	2,520	1812	2,520	For filing a request for reexamination	
1804	920*	1804	920*	Requesting publication of SIR prior to Examiner action	
1805	1,840*	1805	1,840*	Requesting publication of SIR after Examiner action	
1251	110	2251	55	Extension for reply within first month	
1252	420	2252	210	Extension for reply within second month	
1253	950	2253	475	Extension for reply within third month	
1254	1,480	2254	740	Extension for reply within fourth month	
1255	2,010	2255	1,005	Extension for reply within fifth month	
1401	330	2401	165	Notice of Appeal	
1402	330	2402	165	Filing a brief in support of an appeal	
1403	290	2403	145	Request for oral hearing	
1451	1,510	1451	1,510	Petition to institute a public use proceeding	
1452	110	2452	55	Petition to revive – unavoidable	
1453	1,330	2453	655	Petition to revive – unintentional	
1501	1,330	2501	655	Utility issue fee (or reissue)	
1502	480	2502	240	Design issue fee	
1503	640	2503	320	Plant issue fee	
1460	130	1460	130	Petitions to the Commissioner	
1807	50	1807	50	Petitions related to provisional applications	
1806	180	1806	180	Submission of Information Disclosure Stmt	
8021	40	8021	40	Recording each patent assignment per property (times number of properties)	
1809	770	2809	385	Filing a submission after final rejection (37 CFR § 1.129(a))	
1810	770	2810	385	For each additional invention to be examined (37 CFR § 1.129(b))	
1801	770	2801	385	Request for Continued Examination (RCE)	
1802	900	1802	900	Request for expedited examination of a design application	

Other fee (specify) ———

*Reduced by Basic Filing Fee Paid SUBTOTAL (3) ($)

SUBMITTED BY					Complete *(if applicable)*
Name (Print/Type)	Sujit B. Kotwal	*Registration No. (Attorney/Agent)*	43,336	*Telephone*	650-326-2400
Signature	S. B. Kotwal			*Date*	October 21, 2003

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PATENT

Attorney Docket No.: 21751-002200US

TOWNSEND and TOWNSEND and CREW LLP

By: _____

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:	Confirmation No.: 4048
DAVID E. BARAFF et al.	Examiner: Linzy T. McCartney
Application No.: 09/851,940	Technology Center/Art Unit: 2671
Filed: May 10, 2001	AMENDMENT
For: GLOBAL INTERSECTION ANALYSIS FOR DETERMINING INTERSECTIONS OF OBJECTS IN COMPUTER ANIMATION	
Customer No.: 20350	

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In response to the Office Action mailed July 21, 2003, please enter the following amendments and remarks:

Amendments to the Specification begin on page 2 of this paper.

Amendments to the Claims are reflected in the listing of claims which begins on page 4 of this paper.

Remarks/Arguments begin on page 17 of this paper.

COPY

Amendments to the Specification:

Please replace paragraph [0010] beginning on pg. 3 with the following paragraph:

--[0010] In addition, in section 3.2.1 of the above-cited paper, the authors also attempt to examine the cloth in a small neighborhood near the intersection of an edge through a face, as a part of the method. The system takes a majority vote to determine which side is the correct side for the cloth to be on. However, this is a local examination, not a global one. Thus ~~intersection~~ intersections outside of this small neighborhood are not considered. Additionally, the method of the cited paper relies only on statistics; their method forces the cloth to choose "yes, I'm right" or "no, I should be on the other side." Such a ~~systems allow~~ system allows each portion of the cloth to have an equal weight and thus the portions that have the "wrong" orientation effect the determination as much as those portions that have the "correct" orientation.--

Please replace paragraph [0034] on pg. 10 with the following paragraph:

--[0034] The intersections analyzed herein involve either intersections of a surface (strictly speaking, a 2-maniford) with itself or another surface. The case of a curve intersecting a surface (which is applicable when colliding hair or fur with a character's skin) is trivially handled by the methods described. It is noted that the cases of intersection of meshes at a point or by intersection of a whole plane are not addressed herein and do not occur in the normal process of computer animation. Such ~~intersection~~ intersections do not occur because random noise is added to the meshes so that the chances of intersections occurring where an intersection path is not formed are infinitesimal.--

Please replace paragraph [0037] on pg. 11 with the following paragraph:

--[0037] A pair of surfaces may intersect in several manners. The surfaces may not intersect, the surfaces may intersect once, as shown in Fig. 3, or they may intersect multiple times, as shown in Fig. 4. A surface may also intersect itself; however, self-intersections come

in two different forms. The self-intersection may result in two closed intersection paths, as sown in Fig. 5. This occurs when the surface deforms so that two distinct regions of the one surface intersect. In contrast, Fig. 6 shows a self-intersection that results on only one closed intersection path. In this case, the surface has deformed so that a single region has been folded on top of itself.[[.]]--

Please replace paragraph [0042] on pg. 12 with the following paragraph:

--[0042] The computational methods required to implement the above steps are all straightforward, except for the step of determining which vertices lie on the "inside" of a path, versus those which lie "outside" the path. First, it is noted that it is not clear what the "inside" versus the "outside" of an intersection path is. Are the vertices on the blue mesh in Fig. 3b really the "inside" of the intersection path? It is just as valid to say that the uncolored vertices on the blue surface are surrounded by the intersection path. Second, an intersection path may ~~intersects~~ intersect itself, as shown in Figs. 7a and 7B (or even worse). Such *non-simple* paths may or may not define an inside and an outside set of vertices.--

Amendments to the Claims:

Claims 1-24 have been amended. New claims 25-30 have been added. This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

1. (Currently Amended) A method of analyzing intersections between objects in computer animation comprising ~~the steps of~~:

providing a plurality of objects represented by a plurality of meshes, with each of said plurality of objects being represented by one of said plurality of meshes and each of said meshes being formed by a set of vertices, where a set of pairs of vertices of said set of vertices define a set of edges;

checking all edges of said meshes to determine if said set of edges of said meshes intersect with any of said plurality of meshes;

tracing an intersection path formed by intersection of said edges with any of said plurality of meshes; ~~and~~

determining which vertices of said meshes are contained within said intersection path; and ~~and setting a polarity of each of said contained vertices to indicate that those vertices are contained within said intersection path.~~

setting a polarity of each vertex contained within said intersection path to indicate that said vertex is contained within said intersection path, wherein a polarity of a vertex is set based upon a number of disconnected regions formed by said intersection path.

2. (Currently Amended) [[A]] The method of ~~analyzing intersections between objects according to~~ claim 1 wherein ~~said step of~~ determining which vertices of said meshes are contained within said intersection path comprises examining vertices of a mesh that contains said intersection path within a certain distance from a particular edge of said intersection path and characterizing said vertices to determine which vertices of said meshes are contained within said intersection path.

3. (Currently Amended) [[A]] The method of ~~analyzing intersections between objects according to~~ claim 1 wherein ~~said step of~~ determining which vertices of said meshes are contained within said intersection path comprises ~~the steps of~~:

selecting an arbitrary edge of a mesh that crosses said intersection path, where said arbitrary edge is formed by vertices *u* and *v* and where said mesh contains said intersection path;

performing a search of said mesh, radiating from one of said vertices *u* and *v*, identifying all vertices in all of said edges that cross said intersection path, and defining the set of vertices identified as a playpen;

tracing said intersection path and identifying vertices, within said playpen, on a left side of said intersection path as left and retracing said intersection path in an opposite direction and identifying vertices, with said playpen, on a right side of said intersection path as right;

determining whether vertices adjacent to vertices identified as left and right lie outside of said playpen;

discarding said intersection path when at least one of both left and right identified vertices lie outside said playpen;

determining whether at least one vertex adjacent to said right identified vertices lies outside said playpen; and

~~changing said polarity of~~ characterizing each of said left identified vertices ~~to indicate that those vertices are~~ as contained within said intersection path when at least one vertex adjacent to said right identified vertices lies outside said playpen and ~~changing said polarity of~~ characterizing each of said right identified vertices ~~to indicate that those vertices are~~ as contained within said intersection path when at least one vertex adjacent to said left identified vertices lies outside said playpen.

4. (Currently Amended) [[A]] The method of ~~analyzing intersections between objects according to~~ claim 1 wherein said intersection path is a self-intersection with the intersection path being contained in a single mesh and wherein ~~said step of~~ setting a polarity of

each vertex ~~of said contained vertices to indicate that those vertices are contained within said intersection path~~ comprises: ~~setting the~~

associating a first color ~~of said vertices that are~~ with each vertex that is contained within said intersection path ~~to a predetermined color~~ when the intersection yields one region; and

when the intersection yields first and second disconnected regions, ~~setting the~~ associating a second color ~~of vertices of a first portion of~~ with each vertex contained in said first disconnected region and associating a third color with each vertex contained in the second disconnected region. ~~said single mesh contained within said intersection path to a first color and setting the color of vertices of a second portion of said single mesh contained within said intersection path to a second color when the intersection yields two unconnected regions.~~

5. (Currently Amended) [[A]] The method of ~~analyzing intersections between objects according to~~ claim 1 wherein said intersection path is an intersection between a first mesh and a second mesh and ~~said step of~~ wherein setting a polarity of each vertex ~~of said contained vertices to indicate that those vertices are contained within said intersection path~~ comprises ~~setting the~~ associating a first color [[of]] with vertices of the first mesh contained within said intersection path ~~to a first color~~ and ~~setting the~~ associating a second color [[of]] with vertices of the second mesh contained within said intersection path ~~to a second color~~.

6. (Currently Amended) [[A]] The method of ~~analyzing intersections between objects according to one of claims~~ claim 4 ~~and 5~~, further comprising displaying said objects on a computer display with vertices ~~colored as said vertices have been set~~ displayed in colors associated with the vertices.

7. (Currently Amended) A method of determining pinching between objects in computer animation comprising ~~the steps of~~:

providing a plurality of objects represented by a plurality of meshes, with each of said plurality of objects being represented by one of said plurality of meshes and each of said meshes being formed by a set of vertices;

determining an intersection path formed by ~~analyzing~~ intersections between said objects ~~and changing a polarity of each of a plurality vertices contained in an intersection path created by an intersection of said plurality of meshes~~;

setting a polarity of each vertex contained within said intersection path based upon a number of disconnected regions formed by said intersection path;

selecting a particular vertex of said set of vertices bound between surfaces of said objects and closer to one of said surfaces, where said surfaces have defined insides and outsides and said particular vertex is inside of both surfaces;

determining whether any vertices inside of said surfaces have their polarities set; and

indicating that said particular vertex is pinched when any vertices inside of said surfaces have their polarities set.

8. (Currently Amended) [[A]] The method of ~~determining pinching between objects in computer animation according to~~ claim 7 further comprising ~~the step of~~:

constraining motion of said pinched particular vertex when motion in said computer animation is simulated.

9. (Currently Amended) [[A]] The method of ~~determining pinching between objects in computer animation according to~~ claim 7 wherein ~~said step of changing~~ setting a polarity of each vertex ~~of a plurality vertices contained in an intersection path~~ comprises ~~setting the~~ associating a color ~~of each of a plurality vertices~~ with each vertex contained in ~~an~~ the intersection path, the method ~~and~~ further comprising ~~the step of:~~

displaying said objects on a computer display with vertices ~~colored as said vertices have been set~~ displayed in colors associated with the vertices such that ~~an animator can see~~ the intersection and pinching of said objects is visually displayed.

10. (Currently Amended) A method of simulating motion of objects in computer animation, the method comprising ~~the steps of~~:

COPY

providing a plurality of objects represented by a plurality of meshes, with each of said plurality of objects being represented by one of said plurality of meshes and each of said meshes being formed by a set of vertices, where at least one of said objects is an animated object and at least one of said objects is a simulated object;

positioning said objects at some time t to provide one frame of said computer animation;

determining an intersection path formed by ~~analyzing~~ intersections between said objects ~~and setting a polarity of each of a plurality vertices contained in an intersection path created by an intersection of said plurality of meshes~~;

setting a polarity of each vertex contained within said intersection path based upon a number of disconnected regions formed by said intersection path;

setting a simulated force between vertices of said at least one simulated object based on the polarity set for said vertices of said at least one simulated object; and

advancing the computer animation to a time $t + \Delta t$ and simulating motions of said objects using said simulated force to simulate motions of said at least one simulated object.

11. (Currently Amended) [[A]] The method of ~~simulating motion of objects in computer animation according to~~ claim 10 wherein

when said intersection path is a self-intersection with the intersection path contained in a single mesh, ~~said step of~~ setting a polarity of each vertex contained within ~~said polarity of each of said plurality vertices contained in~~ said intersection path comprises ~~setting the~~ associating a first color ~~of~~ with each vertex contained within said intersection path ~~of said plurality vertices to a predetermined color~~ when the intersection yields one region and when the intersection yields first and second disconnect regions, associating a second color with each vertex contained in said first disconnected region and a third color with each vertex contained in the second disconnected region, ~~setting the color of vertices of a first portion of said single mesh contained within said intersection path to a first color and setting the color of vertices of a second portion of said single mesh contained within said intersection path to a second color when the intersection yields two unconnected regions,~~ and

when said intersection path is an intersection between a first mesh and a second mesh, ~~and said step of~~ setting a polarity of each vertex ~~of said plurality of vertices~~ contained in said intersection path comprises ~~setting the~~ associating the second color ~~of each of said plurality vertices of~~ with each vertex of the first mesh contained within said intersection path and associating a third color with each vertex of the second mesh contained within said intersection path. ~~to said first color and setting the color of each of said plurality vertices of the second mesh to said second color.~~

12. (Currently Amended) [[A]] The method of ~~simulating motion of objects in computer animation according to~~ claim 11 wherein ~~said step of~~ setting a simulated force between vertices of said at least one simulated object comprises:

setting said simulated force to cause an attraction between vertices of said at least one simulated object when said vertices are ~~set to~~ associated with said ~~first or~~ second or third colors;

setting said simulated force to cause [[an]] a repulsion between vertices of said at least one simulated object when said vertices are not ~~set to~~ associated with said first color, said second color, or ~~predetermined~~ said third color ~~colors~~; and

setting said simulated force to cause neither an attraction or a repulsion between vertices of said at least one simulated object when said vertices are ~~set to~~ associated with said ~~predetermined~~ first color.

13. (Currently Amended) A computer program product ~~comprising:~~ stored on a computer ~~usable~~ readable medium ~~having computer readable program code means embodied in said medium for causing a computer to manipulate and analyze~~ for processing computer generated objects, said computer ~~readable~~ program ~~code means~~ product comprising:

~~means~~ code for providing a plurality of objects represented by a plurality of meshes, with each of said plurality of objects being represented by one of said plurality of meshes and each of said meshes being formed by a set of vertices, where a set of pairs of vertices of said set of vertices define a set of edges;

~~means~~ code for checking all edges of said meshes to determine if said set of edges of said meshes intersect with any of said plurality of meshes;

~~means~~ code for tracing an intersection path formed by intersection of said edges with any of said plurality of meshes; and

~~means~~ code for determining which vertices of said meshes are contained within said intersection path; and ~~and setting a polarity of each of said contained vertices to indicate that those vertices are contained within said intersection path.~~

code for setting a polarity of each vertex contained within said intersection path to indicate that said vertex is contained within said intersection path, wherein a polarity of a vertex is set based upon a number of disconnected regions formed by said intersection path.

14. (Currently Amended) [[A]] The computer program product ~~according to~~ of claim 13 wherein ~~said means~~ the code for determining which vertices of said meshes are contained within said intersection path comprises ~~means~~ code for examining vertices of a mesh that contains said intersection path within a certain distance from a particular edge of said intersection path and means for characterizing said vertices to determine which vertices of said meshes are contained within said intersection path.

15. (Currently Amended) [[A]] The computer program product ~~according to~~ of claim 13 wherein ~~said means~~ the code for determining which vertices of said meshes are contained within said intersection path comprises:

~~means~~ code for selecting an arbitrary edge of a mesh that crosses said intersection path, where said arbitrary edge is formed by vertices *u* and *v* and where said mesh contains said intersection path;

~~means~~ code for performing a search of said mesh, radiating from one of said vertices *u* and *v*, identifying all vertices in all of said edges that cross said intersection path, and defining the set of vertices identified as a playpen;

~~means~~ code for tracing said intersection path and identifying vertices, within said playpen, on a left side of said intersection path as left and retracing said intersection path in an

opposite direction and identifying vertices, with said playpen, on a right side of said intersection path as right;

~~means~~ code for determining whether vertices adjacent to vertices identified as left and right lie outside of said playpen;

~~means~~ code for discarding said intersection path when at least one of both left and right identified vertices lie outside said playpen;

~~means~~ code for determining whether at least one vertex adjacent to said right identified vertices lies outside said playpen; and

~~means~~ code for ~~changing said polarity of~~ characterizing each of said left identified vertices ~~to indicate that those vertices are~~ as contained within said intersection path when at least one vertex adjacent to said right identified vertices lies outside said playpen and ~~changing said polarity of~~ characterizing each of said right identified vertices ~~to indicate that those vertices are~~ as contained within said intersection path when at least one vertex adjacent to said left identified vertices lies outside said playpen.

16. (Currently Amended) [[A]] The computer program product ~~according to~~ of claim 13 wherein said intersection path is a self-intersection with the intersection path being contained in a single mesh and ~~said means~~ the code for setting a polarity of each vertex ~~of said contained vertices to indicate that those vertices are contained within said intersection path~~ comprises: ~~means for setting the~~

code for associating a first color ~~of said vertices that are~~ with each vertex that is contained within said intersection path ~~to a predetermined color~~ when the intersection yields one region; and

when the intersection yields first and second disconnected regions, ~~means~~ code for ~~setting the~~ associating a second color with each vertex contained in said first disconnected region and associating a third color with each vertex contained in the second disconnected region. ~~of vertices of a first portion of said single mesh contained within said intersection path to a first color and setting the color of vertices of a second portion of said single mesh contained~~

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~~within said intersection path to a second color when the intersection yields two unconnected regions.~~

17. (Currently Amended) [[A]] The computer program product ~~according to~~ of claim 13 wherein said intersection path is an intersection between a first mesh and a second mesh and ~~said means of~~ the code for setting a polarity of each vertex ~~of said contained vertices to indicate that those vertices are contained within said intersection path~~ comprises ~~means~~ code for ~~setting the~~ associating a first color [[of]] with vertices of the first mesh contained within said intersection path ~~to a first color~~ and code for associating a second ~~setting the~~ color [[of]] with vertices of the second mesh contained within said intersection path ~~to a second color~~.

18. (Currently Amended) [[A]] The computer program product ~~according to~~ of claim 16 ~~one of claims 16 and 17~~, further comprising ~~means~~ code for displaying said objects on a computer display with vertices ~~colored as said vertices have been set~~ displayed in colors associated with the vertices.

19. (Currently Amended) A computer program product ~~comprising:~~ stored on a computer ~~usable~~ readable medium ~~having computer readable program code means embodied in said medium~~ for ~~causing a computer to manipulate and analyze~~ processing computer generated objects in computer animation, said computer ~~readable~~ program product ~~code means~~ comprising:

~~means~~ code for providing a plurality of objects represented by a plurality of meshes, with each of said plurality of objects being represented by one of said plurality of meshes and each of said meshes being formed by a set of vertices;

~~means~~ code for determining an intersection path formed by ~~analyzing~~ intersections between said objects ~~and means for changing a polarity of each of a plurality vertices contained in an intersection path created by an intersection of said plurality of meshes~~;

code for setting a polarity of each vertex contained within said intersection path based upon a number of disconnected regions formed by said intersection path;

~~means~~ code for selecting a particular vertex of said set of vertices bound between surfaces of said objects and closer to one of said surfaces, where said surfaces have defined insides and outsides and said particular vertex is inside of both surfaces;

~~means~~ code for determining whether any vertices inside of said surfaces have their polarities set; and

~~means~~ code for indicating that said particular vertex is pinched when any vertices inside of said surfaces have their polarities set.

20. (Currently Amended) [[A]] The computer program product ~~according to~~ of claim 19 further comprising:

~~means~~ code for constraining motion of said pinched particular vertex when motion in said computer animation is simulated.

21. (Currently Amended) [[A]] The computer program product ~~according to~~ of claim 19 wherein ~~said means for changing~~ the code for setting a polarity of each vertex ~~of a plurality vertices~~ contained in ~~an~~ said intersection path comprises ~~means~~ code for ~~setting the~~ associating a color ~~of each of a plurality vertices~~ with each vertex contained in ~~an~~ said intersection path, the computer program product ~~and~~ further comprising[[:]] ~~means~~ code for displaying said objects on a computer display with vertices displayed in colors associated with the vertices ~~colored as said vertices have been set~~ such ~~that an animator can see~~ the intersection and pinching of said objects is visually displayed.

22. (Currently Amended) A computer program product ~~comprising:~~ stored on a computer readable ~~usable~~ medium ~~having computer readable program code means embodied in said medium for causing a computer to manipulate and analyze~~ for processing computer generated objects in computer animation, said computer ~~readable~~ program product ~~code means~~ comprising:

~~means~~ code for providing a plurality of objects represented by a plurality of meshes, with each of said plurality of objects being represented by one of said plurality of

meshes and each of said meshes being formed by a set of vertices, where at least one of said objects is an animated object and at least one of said objects is a simulated object;

~~means~~ code for positioning said objects at some time t to provide one frame of said computer animation;

~~means~~ code for determining an intersection path formed by ~~analyzing~~ intersections between said objects ~~and setting a polarity of each of a plurality vertices contained in an intersection path created by an intersection of said plurality of meshes~~;

code for setting a polarity of each vertex contained within said intersection path based upon a number of disconnected regions formed by said intersection path;

~~means~~ code for setting a simulated force between vertices of said at least one simulated object based on the polarity set for said vertices of said at least one simulated object; and

~~means~~ code for advancing the computer animation to a time $t + \Delta t$ and simulating motions of said objects using said simulated force to simulate motions of said at least one simulated object.

23. (Currently Amended) [[A]] The computer program product ~~according to~~ of claim 22 wherein

when said intersection path is a self-intersection with the intersection path contained in a single mesh, said ~~means~~ code for setting a polarity of each vertex contained within ~~said polarity of each of said plurality vertices contained in~~ said intersection path comprises ~~means~~ code for associating a first color with each vertex contained within said intersection path ~~setting the color of each of said plurality vertices to a predetermined color~~ when the intersection yields one region and when said intersection path yields first and second disconnected regions, code for associating a second color with each vertex contained in said first disconnected region and a third color with each vertex contained in the second disconnected region, ~~setting the color of vertices of a first portion of said single mesh contained within said intersection path to a first color and setting the color of vertices of a second portion of said single mesh contained within~~

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~~said intersection path to a second color when the intersection yields two unconnected regions,~~ and

when said intersection path is formed from an intersection between a first mesh and a second mesh, the code for ~~said means for~~ setting a polarity of each vertex ~~of said plurality of vertices~~ contained in said intersection path comprises ~~means~~ code for ~~setting the~~ associating the second color ~~of each of said plurality vertices~~ with each vertex of the first mesh ~~to said first color~~ and ~~setting the~~ associating the third color with ~~of~~ each ~~of said plurality vertices~~ vertex of the second mesh ~~to said second color~~.

24. (Currently Amended) [[A]] The computer program product ~~according to~~ of claim 23 wherein ~~said means for~~ the code for setting a simulated force between vertices of said at least one simulated object comprises:

~~means~~ code for setting said simulated force to cause an attraction between vertices of said at least one simulated object when said vertices are ~~set to~~ associated with said ~~first or~~ second or third colors;

~~means~~ code for setting said simulated force to cause [[an]] a repulsion between vertices of said at least one simulated object when said vertices are not ~~set to~~ associated with said first color, said second color, or ~~predetermined~~ said third color ~~colors~~; and

~~means~~ code for setting said simulated force to cause neither an attraction or a repulsion between vertices of said at least one simulated object when said vertices are ~~set to~~ associated with said ~~predetermined~~ first color.

25. (New) The method of claim 5, further comprising displaying said objects on a computer display with vertices displayed in colors associated with the vertices.

26. (New) The computer program product of claim 17, further comprising code for displaying said objects on a computer display with vertices displayed in colors associated with the vertices.

27. (New) A method of analyzing intersections, the method comprising:

determining an intersection path formed by an intersection of a first mesh portion and a second mesh portion, wherein each mesh portion comprises a plurality of vertices;

determining a set of vertices of the first mesh portion and the second mesh portion that are contained within the intersection path; and

setting a value for each vertex in the set of vertices based upon based upon a number of disconnected regions formed by said intersection path.

28. (New) The method of claim 27 wherein the first mesh portion and the second mesh portion are portions of a mesh representing an object.

29. (New) The method of claim 27 wherein the first mesh portion is a portion of a first mesh representing a first object and the second mesh portion is a portion of a second mesh representing a second object.

30. (New) The method of claim 27 wherein setting a value for each vertex in the set of vertices comprises:

setting each vertex in the set of vertices to a first value if a single region is formed by the intersection path; and

if the intersection path forms a first region on the first mesh portion and a second region on the second mesh portion that is disconnected from the first region,

setting each vertex in the set of vertices that is in the first region to a second value, and

setting each vertex in the set of vertices that is in the second region to a third value.

REMARKS/ARGUMENTS

STATUS OF THE APPLICATION

Claims 1-24 were pending in this application and examined.

Claims 3, 12, 15, and 24 are objected to as being dependent upon a rejected base claim, but are deemed allowable if rewritten in independent form including all of the limitations of the base claims and any intervening claims.

Claims 1, 2, 13, and 14 are rejected under 35 U.S.C. §103(a) as being unpatentable over Volino et al., "Accurate Collision Response on Polygonal Meshes" [hereinafter "Volino_Accurate"] in view of Volino et al., "Collision and Self-Collision Detection: Efficient and Robust Solutions for Highly Deformable Surfaces" [hereinafter "Volino_Collision"]. Claims 5 and 17 are rejected under 35 U.S.C. §103(a) as being unpatentable over Volino_Accurate in view of Volino_Collision and further in view of Yaeger (U.S. Patent 5,515,489) [hereinafter "Yaeger"]. Claims 4, 6, 16, and 18 are rejected under 35 U.S.C. §103(a) as being unpatentable over Volino_Accurate in view of Volino_Collision and further in view of Kommrusch et al. (U.S. Patent 5,444,838) [hereinafter "Kommrusch"]. Claims 7, 9, 19, and 21 are rejected under 35 U.S.C. §103(a) as being unpatentable over Volino_Accurate in view of Volino_Collision and further in view of Rossignac et al., "Interactive Inspection of Solids: Cross-sections and Interferences" [hereinafter "Rossignac"]. Claims 8 and 20 are rejected under 35 U.S.C. §103(a) as being unpatentable over Volino_Accurate in view of Volino_Collision and further in view of Rossignac and Jeff Lander "Skin Them Bones: Game Programming for the Web Generation" [hereinafter "Lander"]. Claims 10 and 20 are rejected under 35 U.S.C. §103(a) as being unpatentable over Volino_Accurate in view of Volino_Collision and further in view of Lafleur et al., "Cloth Animation with Self-Collision Detection" [hereinafter "Lafleur"]. Claims 11 and 23 are rejected under 35 U.S.C. §103(a) as being unpatentable over Volino_Accurate in view of Volino_Collision and further in view of Lafleur and Kommrusch.

Applicants have amended claims 1-24. New claims 25-30 have been added. Applicants submit that no new subject matter has been introduced by the amendments. Claims 1-30 remain pending in this application after filing of this amendment.

THE SPECIFICATION

The specification has been amended to correct inadvertently introduced typographical errors. Applicants submit that no new subject matter has been introduced by the amendments.

THE CLAIMS

Rejections under 35 U.S.C. 103

Claim 1

Applicants submit that the features of the present invention recited in independent claim 1, as amended, are not made obvious by the cited references. Claim 1, as amended, recites:

> 1. A method of analyzing intersections between objects in computer animation comprising the steps of:
>
> . . .
>
> determining which vertices of said meshes are contained within said intersection path; and
>
> setting a polarity of each vertex contained within said intersection path to indicate that said vertex is contained within said intersection path, wherein a polarity of a vertex is set based upon a number of disconnected regions formed by said intersection path. (Applicants' claim 1, as amended, emphasis added).

As recited above, the polarity of each vertex contained within the intersection path is set based upon the number of disconnected regions formed by the intersection path. The setting of polarities for vertices based upon the number of regions formed by an intersection path is explained in the Application specification in paragraph [0041] on page 12. The specification states that

> If an intersection path arises from a situation as depicted in either Fig. 3b or Fig. 5b, then there are two such regions. Arbitrarily, the vertices in one region are assigned the "color" $black_i$ and the vertices in the other region are given the color $white_i$. If the intersection is a self-

> intersection that yields a single region, as in Fig. 6, then all the vertices in that one region are marked as having color red_i. A vertex is allowed to have an arbitrary number of colors. (Excerpt from paragraph [0041] on pg. 12)

Accordingly, various polarity values (e.g., "$white_i$" or "$black_i$", or "red_i") may be associated with a vertex based upon whether the intersection path forms a single connected region (as in Fig. 6) or multiple disconnected regions (as in Figs. 3b or Fig. 5b)--i.e., based upon the number of disconnected regions formed by the intersection path.

As described in the specification, the polarities associated with the vertices may be used in various different applications such as to simulate motion of objects in response to collisions (Specification: pgs. 14, 15), pinch detection (Specification: pgs. 15, 16), to determine correct orientation in motion simulation programs (Specification: pgs. 16, 17), etc.

Applicants submit that the above-described concept recited in claim 1 is not taught or suggested by the cited references, considered individually or in combination. Volino_Accurate teaches a general geometrical method for enforcing collisions. There is no teaching or suggestion of setting polarities for vertices within an intersection path based upon the number of disconnected regions formed by the intersection path. In fact, Volino_Accurate does not even attempt to identify the number of regions formed by an intersection path.

Volino_Collision also does not teach or suggest such a concept. Volino_Collision teaches an algorithm for detecting collisions, including self collisions, and techniques for evaluating collision inside-outside orientation. Volino_Collision provides techniques for determining if an element is at the correct side of a surface or at the other side (See Volino_Collision: Section 3 on pg. 7). The in-out orientation is updated according to the moves of the objects (See Volino_Collision: Section 3.1 on pg. 7).

Applicants submit that Volino_Collision also does not attempt to identify the number of regions formed by an intersection path. As a result, Volino_Collision also does not teach or suggest setting polarities for the vertices based upon the number of regions. Applicants submit that determination of the inside-outside orientation taught by Volino_Collision is not the same as setting polarities for the vertices as recited in claim 1 of the application. In

Volino_Collision, the "most probable" orientation for a collision region is determined by considering statistically the individual collision orientations. Then, the common collision orientation is given for every collision (See Volino_Collision: Section 3.2 on pgs. 8 and 9). Unlike the present invention recited in claim 1, there are no polarities set for the vertices in Volino_Collision can then used for various applications as described in the present application. Accordingly, the orientations set in Volino_Collision (either "correct side" or "other side") are not that same as polarities. Accordingly, Applicants respectfully submit that claim 1 as amended is not taught or suggested by Volino_Collision.

On the contrary, Applicants submit that the remnance techniques taught in Volino_Collision are similar to the prior art techniques described in the Application specification that make use of "history" (i.e., based upon past positions and orientations), rely on statistics, and take the majority vote to determine which side is the correct side for the cloth to be on (See Application specification pgs. 3 and 4, and Volino_Collision sections 3.0, 3.1, and 3.2). This is substantially different from the invention recited in claim 1.

Applicants thus submit that claim 1, as amended, is not taught or suggested by Volino_Collision.

Applicants further submit that other cited references (i.e., Yaeger, Kommrusch, Rossignac, Lander, and Lafleur) also fail to teach or suggest setting of polarities of vertices based upon the number of disconnected regions formed by an intersection path. Accordingly, Applicants submit that the cited references considered individually do not teach or suggest the invention as recited in claim 1. Further, even if the references were combined, the resultant combination would fail to teach such a concept as recited in claim 1.

Accordingly, Applicants submit that claim 1, as amended, is in a condition for allowance.

Claims 2-24

Applicants respectfully submit that claims 2-6 that depend from claim 1 should be allowed for at least a similar rationale as discussed above for allowing claim 1, and others.

Independent claims 7, 10, 13, 19, and 22 have been amended to include the feature of claim 1 described above. Accordingly, Applicants submit that claims 7, 10, 13, 19, and 22 should be allowed for at least a similar rationale as discussed above for allowing claim 1, and others. Dependent claims 8-9, 11-12, 14-18, 20-21, and 23-24 should be allowed for at least a similar rationale as discussed for allowing the independent claim from which they depend.

New Claims

Applicants submit that new claims 25-30 are also allowable. Claims 25 and 26 represent dependent claims corresponding to previously pending multiple dependent claims 6 and 18.

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 650-326-2400.

Respectfully submitted,

S. B. Kotwal

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REVOCATION OF POWER OF ATTORNEY OR AUTHORIZATION OF AGENT

Application Number	09/851,940
Filing Date	May 10, 2001
First Named Inventor	David Baraff
Art Unit	2671
Examiner Name	L.T. McCartney
Attorney Docket Number	021751-002200US

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☒ Assignee of record of the entire interest. See 37 CFR 3.71.
Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)

SIGNATURE of Applicant or Assignee of Record

Name	Lois Scali, Executive Vice President and General Counsel, Pixar		
Signature	Lois Scali		
Date	10/16/03	Telephone	510-752-3000

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POWER OF ATTORNEY OR AUTHORIZATION OF AGENT

Application Number	09/851,940
Filing Date	May 10, 2001
First Named Inventor	David Baraff
Title	Global Intersection Analysis for Determining Intersections of Objects in Computer Animation
Art Unit	2671
Examiner Name	L.T. McCartney
Attorney Docket Number	021751-002200US

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I am the:

☐ Applicant/Inventor.

☒ Assignee of record of the entire interest. See 37 CFR 3.71.

Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96).

SIGNATURE of Applicant or Assignee of Record

Name	Lois Scali, Executive VP and General Counsel, Pixar		
Signature	Lois Scali		
Date	10/16/02	Telephone	510-752-3000

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Attorney Docket No. 021751-002200US

STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: David Baraff et al.

Application No./Patent No.: 09/851,940 Filed/Issue Date: May 10, 2001

Entitled: Global Intersection Analysis for Determining Intersections of Objects in Computer Animation

Pixar dba Pixar Animation Studios, a corporation

(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that it is:

1. ☒ the assignee of the entire right, title, and interest; or
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10/16/03
Date

510 752-3000
Telephone number

Lois Scali
Typed or printed name

Signature

Executive Vice President and General Counsel
Title

60019173 v1

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ARENT FOX KINTNER PLOTKIN & KAHN, PLLC

Docket No. 022972-00008

U.S. ASSIGNMENT

IN CONSIDERATION of the sum of One Dollar ($1.00), and of other good and valuable consideration paid to the undersigned inventor(s) (hereinafter ASSIGNOR) by

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PIXAR ANIMATION STUDIOS

(hereinafter ASSIGNEE), the receipt of which is hereby acknowledged, the undersigned ASSIGNOR hereby sells, assigns and transfers to ASSIGNEE the entire and exclusive right, title and interest to the invention entitled

[Title of Invention]

GLOBAL INTERSECTION ANALYSIS FOR DETERMINING INTERSECTIONS OF OBJECTS IN COMPUTER ANIMATION

[*If the assignment is being filed after the filing of the application, this section must be completed]

for which application for Letters Patent of the United States was executed on even date herewith unless otherwise indicated below:

*filed on _____, Serial No. _____

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and all Letters Patent of the United States to be obtained therefor on said application or any continuation, division, renewal, substitute, reissue or reexamination thereof for the full term or terms for which the same may be granted.

The ASSIGNOR agrees to execute all papers necessary in connection with application and any continuing, divisional, reissue or reexamination applications thereof and also to execute separate assignments in connection with such applications as the ASSIGNEE may deem necessary or expedient.

The ASSIGNOR agrees to execute all papers necessary in connection with any interference, litigation, or other legal proceeding which may be declared concerning this application or any continuation, division, reissue or reexamination thereof or Letters Patent or reissue patent issued thereon and to cooperate with the ASSIGNEE in every way possible in obtaining and producing evidence and proceeding with such interference, litigation, or other legal proceeding.

IN WITNESS WHEREOF, the undersigned inventor(s) has (have) affixed his/her/their signature(s).

[Signature(s) of Assignor(s)]

(SIGNATURE)	David E. Baraff (TYPE NAME)	5/1/2001 (DATE)
(SIGNATURE)	Andrew Witkin (TYPE NAME)	5/1/2001 (DATE)
(SIGNATURE)	Michael Kass (TYPE NAME)	5/1/2001 (DATE)
(SIGNATURE)	(TYPE NAME)	(DATE)

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Atty Docket No. 21751-002200US

PTO FAX NO.: (703) 872-9314
ATTENTION: Examiner Linzy T. McCartney Group Art Unit 2671
TELEPHONE NO.: (703) 605-0745

OFFICIAL COMMUNICATION
AMENDMENT, REVOCATION OF POWER OF ATTORNEY, POWER OF ATTORNEY, STATEMENT UNDER 3.73(B) FOR FOR ENTRY IN U.S. PATENT APPLICATION NO. 09/851,940, FILED MAY 10, 2001

FOR THE PERSONAL ATTENTION OF EXAMINER LINZY T. MCCARTNEY

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Document(s) Attached

1. SB/21 Transmittal Form (1 page)
2. SB/17 Fee (in duplicate) (2 pages)
3. Amendment (21 pages)
4. Revocation of Power of Attorney or Authorization of Agent (1 page)
5. Power of Attorney or Authorization of Agent (1 page)
6. Statement Under 3.73(b) w/ copy of Assignment as filed (2 pages)

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